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Applicant(s):	Ronald D. Shaw		
Assignee:	Dell Products L.P.		
Title:	System and Method for Communication of Keyboard and Touchpad Inputs as HID Packets Embedded on a SMBus		
Serial No.:	10/723,896	Filing Date:	November 26, 2003
Examiner:	Matthew D. Spittle	Group Art Unit:	2111
Docket No.:	DC-05727	Customer No.:	33438

Austin, Texas
December 2, 2005

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 ALEXANDRIA, VA 22313-1450

DECLARATION OF RONALD D. SHAW UNDER 37 CFR § 1.131

1. My name is Ronald D. Shaw. I am the named inventor of the above-referenced patent application, filed on November 26, 2003, and assigned to Dell Products L.P.
2. I am informed that the Examiner has rejected a number of claims of the above-referenced application based on a slide presentation provided by me in an Information Disclosure Statement. The slide presentation was made by Sundeep Bajikar of Intel Corporation on September 17, 2003. Slide 16 of the Bajikar slide presentation was added from materials presented by me to Intel several months prior to the September 17, 2003 presentation by Bajikar.
3. Attached hereto as Exhibit A is a true and correct copy of an invention disclosure form submitted by me to my employer on July 7, 2003. The invention disclosure form was considered by a Dell patent committee and approved for the filing of a patent application in September of 2003. I worked with Dell's outside patent attorney to prepare and file the above-referenced patent application on November 26, 2003.

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4. Attached hereto as Exhibit B is the May 28, 2003 slide presentation prepared by me as referenced in the invention disclosure form.
5. I declare under penalty of perjury by the laws of the United States that the facts stated in this declaration are true and correct.



Ronald D. Shaw

Invention Disclosure Form (Dell Confidential)

DC-05727

EXHIBIT A

Title:**MAPPING HID PROTOCOL ONTO SMBUS FOR TOUCH PAD / KEYS SCAN INTERFACE.****INVENTORS****Ronald D Shaw (Dell), Ron_Shaw@dell.com, (512) 728-1922****Line of Business:** Advanced Client Engineering**Manager:** Richard Schuckle**Reporting Director/VP:** Kevin Kettler**Reporting VP/GM:** Jeffrey Clarke**Home Phone:** 512-249-5477**Citizenship:** United States**RELEVANT DATES & DISCLOSURES****Submission Date:** 7/7/2003**Conception Date:** 5/28/2003**Invention first described in:** Presentation 05/28/2003**First offer for sale:** TBD**First production use/ship date:** TBD**Anticipated offer for sale,
production use, or ship date:** TBD**Disclosure outside of Dell? Yes****If yes, to whom?** Intel/NSC/SMSC/Renesas/Alps/Synaptics**Was the disclosure made under an NDA? Yes****TECHNOLOGY****Product Line:** Portables**Project Code Name(s):** CY 2005 Notebooks**Relevant Standards:****WITNESSES****Witness 1:** Thomas Pratt**Witness 2:** William Sauber

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THE PROBLEM

Currently the keyboard scans for portables is done by the EC on the motherboard. There is movement in the industry to move the keyboard scanning to the touchpad. This will reduce the number of signals begin transmitted from the palm rest down to the motherboard.

There is also a movement in the industry to develop secure keyboards and secure touchpad for portable computers. The current proposal uses a set of registers which simulate a HID device on the LPC bus similar to the HID devices used on USB.

To minimize the amount of silicon on the motherboard, a simple protocol is needed to allow HID messages to be transmitted from the touchpad to the motherboard.

PRIOR SOLUTIONS/EXISTING TECHNOLOGY

Currently, HID packets are used for USB keyboards and pointing devices.

PROPOSED SOLUTIONS

The touchpad microcontroller will convert the keyboard scan and pointing device inputs into standard HID packets. These HID packets will be embedded into SMBus messages which is passed to the motherboard and transferred into the HID registers which are visible to the firmware and/or software.

By directly mapping HID packets into SMBus messages, a reduction in complexity on the motherboard can be realized. A simple state machine can transfer successful SMBus messages directly into the HID registers.

FIGURES

EXHIBIT B

Page 1

Notebook re-Partitioning Keyboard / Touchpad

Ron Shaw

Technologist

May 28, 2003

Advanced Product Engineering 



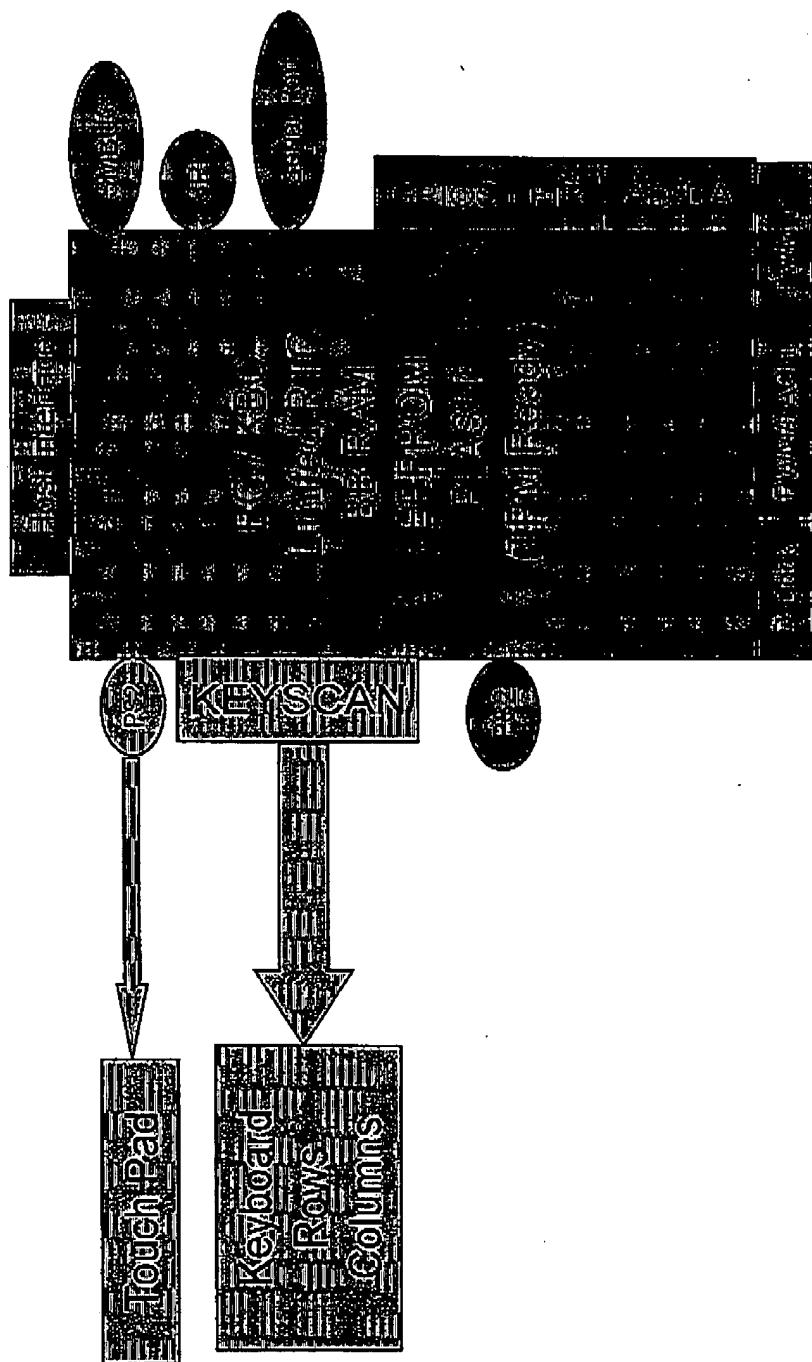
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Current Design



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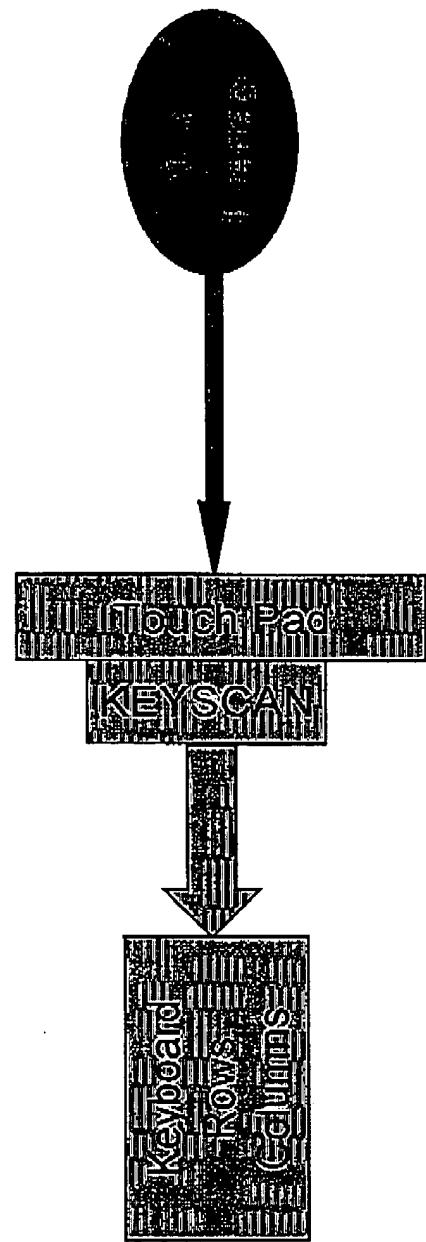
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New Internal I/O Interface

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Page 3

KEYSCAN / Touchpad



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- ◆ **Desire to move the KEYS CAN function to the Touch Pad**
 - Frees up pins on the EC/KBC
 - Reduces the cable size to the palm rest
 - Eases assembly
- ◆ **New interface between EC/KBC to Touch Pad**
 - Reduced pin count (from KEYS CAN)
- ◆ **Opportunity to prepare for Trusted Keyboard / Touch Pad**
 - Trusted interface is not needed, but should be taken into account
 - Need to support HID packets

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What type of electrical interface?



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- ◆ **Requires multi-master support**
 - Touch Pad needs to initiate message when keys are pressed
- ◆ **Needs to be low power**
 - Full USB is a non-started
- ◆ **Needs to work with minimal hardware on EC/KBC**
 - This is true when running in trusted mode – Not attached to EC/KBC
- ◆ **Single Wire interface? (NSC)**
- ◆ **Expand PS/2 interface?**
- ◆ **USB LITE interface?**

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General Requirements



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SMBUS



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SPI



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Serial Port



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D-Dock Support

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PWM / TACH



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PWM In



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AD / DA



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FIR



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GPIO



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Limited RTC



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BB RAM



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EEPROM / FLASH / (TPM Ready)



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Ronald D. Shaw

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